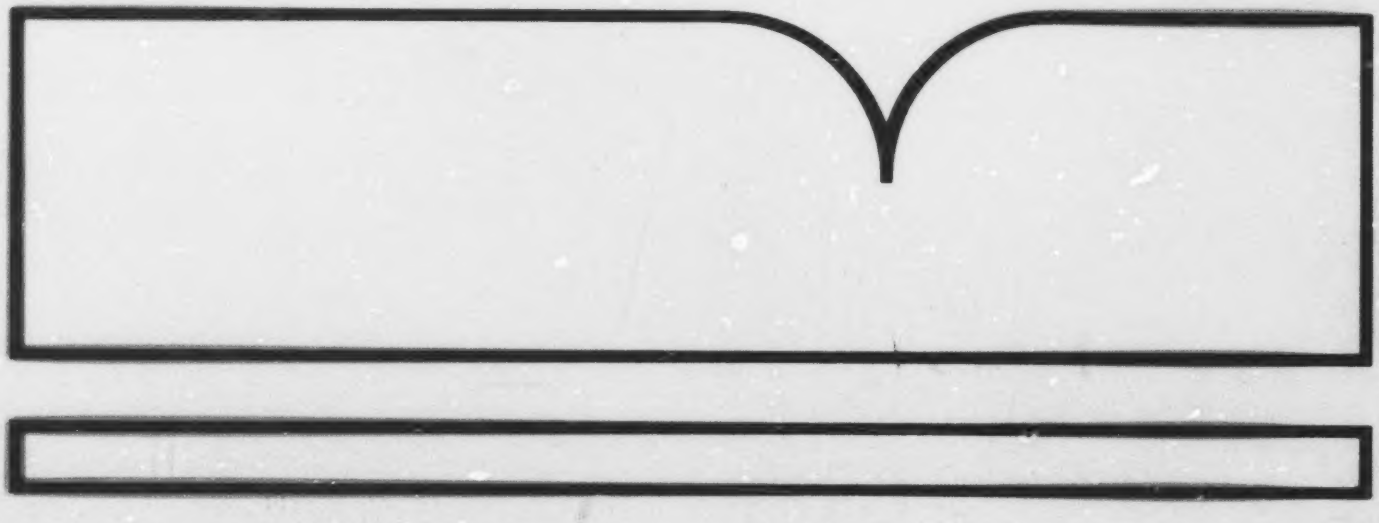
PB88-188263

Superfund Record of Decision (EPA Region 4)
NW 58th Street Landfill, Dade County, Florida
September 1987

(U.S.) Environmental Protection Agency
Washington, DC

21 Sep 87



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Office of
Emergency and
Remedial Response

EPA/ROD/R04-87/027
September 1987

EPA

Superfund Record of Decision:

NW 58th St. L.F., FL

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15. SUPPLEMENTARY NOTES

surface

16. ABSTRACT

The Northwest 58th Street Landfill, one of three NPL sites that comprise the Biscayne Aquifer Superfund Study, is a one-square-mile site in northwest Dade County, Florida, which is bordered by a rock pit operation and a resource recovery plant. The site is located in an area where the ground water table is two to three feet below the ground face. From 1952 to 1982, the site operated as a municipal landfill receiving approximately 60,000 tons of waste in 1952 and increasing annually over the thirty years of operation to over 1,000,000 tons per year in the 1980s. Small quantities of hazardous materials from households (e.g., pesticides, paints, solvents, etc.) was considered to be municipal waste and also disposed of at the landfill. In 1975, the landfill operation initiated a program of providing daily cover to the site; however, prior to this, the operation did not compact wastes or add daily cover. As a result of earlier practices, the landfill is believed to be saturated with water so that the volume of rainfall entering the land equals the volume of leachate released. Since October 1982, the landfill has only received debris, quarry wastes an water paint sludges. The primary route for human exposure to the contamination is through the drinking water, and, in particular, two sets of public drinking water wells 2.5 miles down gradient of the landfill. These wells serve an estimated 750,000 people. A 1986
(See Attached Sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Northwest 58th Street Landfill, FL Third Remedial Action Contaminated Media: gw, soil Key contaminants: VOCs, PCE, TCE, inorganics		

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EPA/ROD/R01-87/023
Northwest 58th Street Landfill, FL
Third Remedial Action

16. ABSTRACT (continued)

Endangerment Assessment analysis identified eight contaminants of concern: arsenic, chromium, zinc, benzene, chlorobenzene, 1,1,2,2-tetrachloroethane, trichloroethene and vinyl chloride.

The selected remedial action for this site includes: controlling leachate generation by a combination of grading, drainage control and capping; providing a public water supply to approximately 60 underground wells; and landfill closure. The estimated capital cost for this remedial action is $5,500,000 with annual O&M of $1,500,000.

RECORD OF DECISION

SITE NAME AND LOCATION

NW 58th Street Landfill
Dade County, Florida

STATEMENT OF PURPOSE

This decision document represents the selected remedial action for this site developed in accordance with CERCLA, as amended by SARA, and, to the extent practicable, the National Contingency Plan.

The State of Florida has been consulted on the selected remedy.

STATEMENT OF BASIS

This decision is based upon the administrative record. The attached index identifies the items which comprise the administrative record upon which the selection of remedial action is based.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy is the final operable unit of the Biscayne Aquifer Study Area. The previous operable units, and their Records of Decision, were: Miami Drum Services - soils and groundwater contamination cleanup; Miami Airport (Varsol Spill) - no action; Study Area Ground Water - additional treatment of groundwater before distribution for public use. This ROD is concerned with onsite soil contamination, site related ground water contamination, and downgradient private well users associated with the NW 58th Street Landfill.

The remedy selected for the NW 58th Street Landfill site is to:

- Close the landfill in accordance with the technical requirements of the applicable state regulation (FAC Chapter 17-7 (1985)), and the relevant and appropriate EPA guidance document (Covers for Uncontrolled Hazardous Waste Sites, EPA/540/2-85/002). The EPA document will provide the specific methods for evaluation of the cover design.

- Provide municipal water to an area of private wells users east of the landfill.

The closure will include leachate control through a combination of grading, drainage control, and capping. This will minimize the infiltration of stormwater into the landfill, thus controlling the leachate produced from the landfill. If necessary, gas migration and odor controls will also be implemented. Long term monitoring of groundwater quality and O&M of the closure is also required.

The Biscayne Aquifer is the sole source of drinking water for the Miami/Dade County area. As such, contamination of this aquifer is of special concern. The Site Area Ground Water ROD addressed area-wide groundwater contamination by requiring additional treatment at the municipal water treatment plants. The NW 58th Street Landfill ROD will provide public drinking water to the last of the private well users believed to be at risk.

DECLARATION

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate, and is cost-effective. The statutory preference for treatment is not satisfied because treatment was found to be impracticable due to the magnitude of waste to be treated (estimated at 27 million cubic yards). In addition, the groundwater contamination in the Biscayne Aquifer is widespread, so collecting and treating the groundwater around the landfill would not adequately protect human health. This widespread groundwater contamination is to be collected and treated by air strippers at the water treatment plants serving the affected wellfields, and was the remedial action selected in the Study Area Ground Water Record of Decision (September 1985).

Lee A. DeHihns III

9/21/87

Lee A. DeHihns, III
Acting Regional Administrator

Date

I. SITE NAME, LOCATION, AND DESCRIPTION

The Northwest 58th Street Landfill is a one square mile site in Northwest Dade County, Florida near the western perimeters of the Town of Medley and the City of Miami Springs (Figure 1). Along the eastern edge of the landfill is a loaf-shaped mound 80-90 feet high which covers an area of approximately 90 acres. In the middle of the site is a mound which is 50-60 feet high, and covers approximately 62 acres. In between the two mounds is a small area of virgin land.

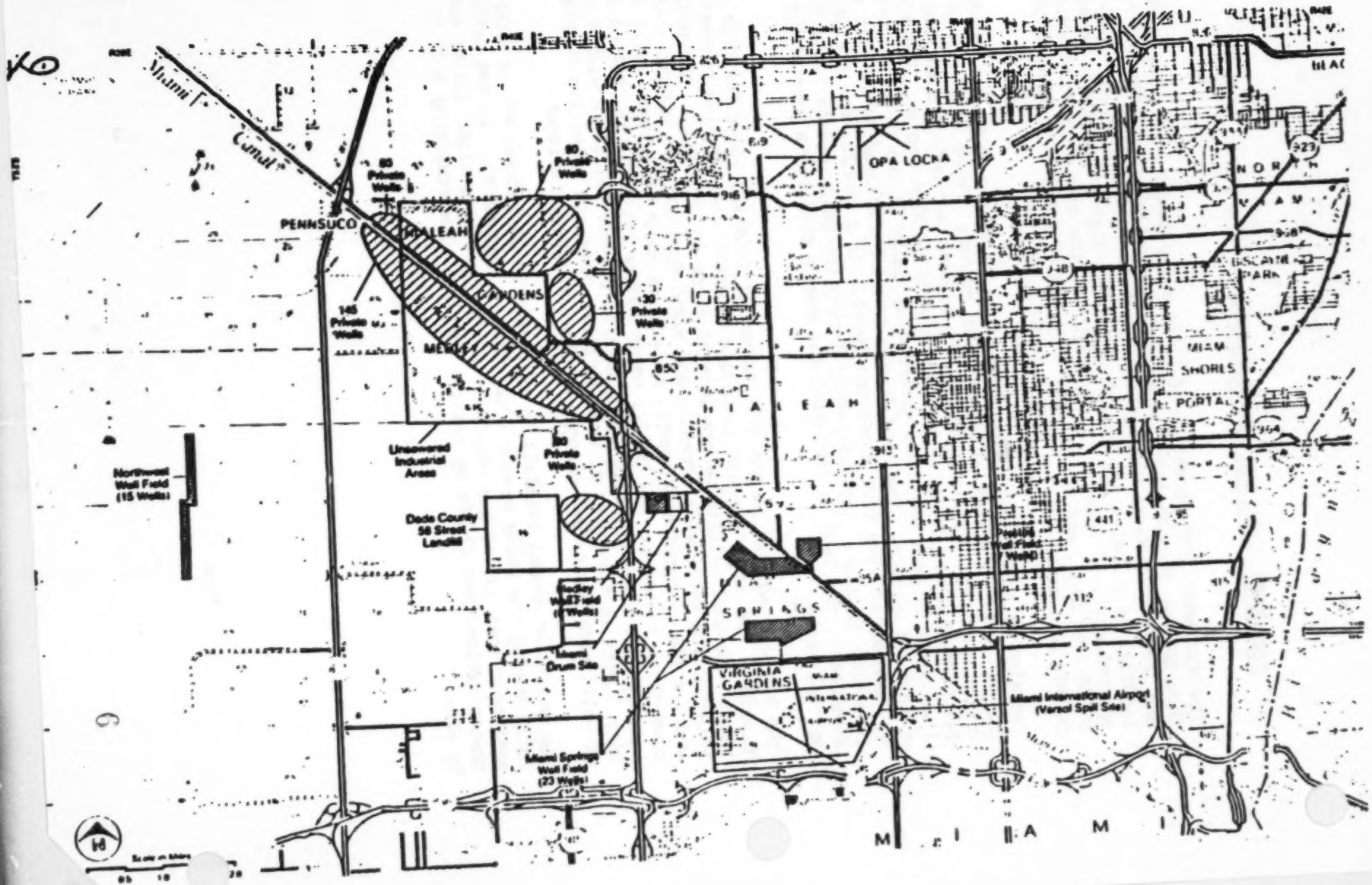
The site is bordered by industrial areas to the south across NW 58th Street, and to the east across NW 87th Avenue. There is a rock pit operation to the north across NW 74th Street, and undeveloped land and a Resource Recovery Plant to the west across NW 97th Avenue. The site is located in an area where the groundwater table is two to three feet below the ground surface. The land in the area of the landfill is flat and at an altitude of five feet above sea level. As a result, the drainage in this area is poor. Intermittently during the rainy season (July through September), the land is inundated and swampy conditions persist for several weeks.

The Biscayne Aquifer is the sole source of drinking water for Dade County, Florida. The major concern is public exposure via drinking contaminated water. Several wellfields are located close to this site. Two public water source wellfields (Preston and Miami Springs) are located within 2-1/2 miles downgradient (east), as well as about 60 private wells used for commercial purposes. One public water source wellfield is located approximately four miles upgradient and several private wells are within the City limits to the north of the landfill. However, selective pumping of wellfields has caused changes in the localized gradients.

The estimated annual rainfall in this area is 60 inches, 80% of which falls during the rainy season (July through September). It was further estimated that 33% of the rainfall is lost by evaporation, 33% by evapotranspiration, and 27-30% by coastal seepage. The remaining 3-7% is used by man.

Figure 1

LOCATION OF POTENTIAL CONTAMINATION SITES, PUBLIC WELL FIELDS, AND PRIVATE WELLS IN STUDY AREA



II. SITE HISTORY

A. Operations

The site began operation as an open dump in 1952. Shallow trenches were dug for waste disposal, resulting in deposition of refuse in the saturated zone of the Biscayne Aquifer. In addition, open burning of waste for volume reduction was practiced until it was banned in 1960. The landfill received an estimated 60,000 tons of waste in 1952. The annual volume of waste increased until the landfill was receiving over 1 million tons of waste each year of operation in the 1980's. The landfill ceased accepting municipal waste October, in 1982, and since then has received only construction debris, quarry wastes, and water plant sludges. In January, 1975, a program of providing daily cover was instituted. The cover utilized has consisted of muck and crushed rock from quarry overburden and, more recently, calcium carbonate sludge from water treatment plants.

The landfill was operated for over 30 years as a municipal landfill. It has never been operated as a hazardous waste landfill. It must be recognized, however, that over the last 35 years, the definition of a "hazardous waste" has changed. Therefore, a substance which may be considered hazardous now may have been accepted in the landfill at some time in the past. Furthermore, the normal operation of landfills which accept only municipal-type wastes will include the disposal of very small quantities of hazardous materials from households (e.g. insect spray containers, old paint, solvents, etc). The quantities are small in comparision to the overall wastes contained in a municipal landfill.

The landfill operation in the past did not include a program of compacting the waste, nor did it include daily cover. Therefore, the landfill is believed to be saturated with water. This means the volume of rainfall which seeps into the landfill will be the volume of leachate released. The quality of the leachate is a very good indicator of the potential environmental problems the landfill could cause.

B. Studies Conducted

There have been several site investigations conducted under both state and federal authority. The investigations include:

1) 1975 United States Geological Service
   Groundwater Quality Study

2) 1976 HJ Ross Associates
   Report on NW 58th Street Sanitary Landfill

3) 1981 Ecology and Environment, Inc.
   Mitre Model Scoring of 58th Street Landfill

4) 1981 Technos
Geophysical Surveys

5) 1981 Reynolds, Smith & Hill
Closure Plan (Preliminary Report)

6) 1982 Florida Department Of Environmental Regulation - Tallahassee
Chemical Analyses of Groundwater in the Vicinity of the
NW 58th Street Landfill, Dade County, Florida

7) 1982 CH_2M Hill
Biscayne Aquifer/Dade County Study, Phase I, Volumes I - III.

8) 1983 Reynolds, Smith, and Hill
Technical Specifications for NW 58th St Landfill Closing (Draft)

9) 1984 Law Engineering Testing Co
Report on Geotechnical Engineering Evaluation: Sanitary
Landfill Cover Materials - Metro Dade Landfill Closeouts
Phase II North Dade and NW 58th St. Landfills.

10) 1984 CH_2M Hill
Biscayne Aquifer/Dade County Study, Phase II
Volumes I and II (Remedial Investigation)

11) 1984 Environmental Science & Engineering
Methane Gas Study

12) 1985 Dade County Department of Environmental Management
Northwest Wellfield Protection Study

13) 1985 CH_2M Hill
Biscayne Aquifer/Dade County Study,Phase III
(Feasibility Study)

14) 1987 Metro Dade Public Works Department
Summary of Ongoing Chemical Analysis of Aquifer Water
Quality Downstream of NW 58th St. Landfill

15) 1987 Florida Department of Environmental Regulation - West Palm Beach
Summary of Ongoing Chemical Analyses of Aquifer Water
Quality Downstream of NW 58th St. Landfill

16) 1987 Camp, Dresser, and McKee Inc.
Evaluation of Atlernatives Memorandum for the NW 58th
Street Landfill Site Dade County Florida

17) 1987 Florida Department of Environmental Regulation-
West Palm Beach
Recent Data from Monitoring Wells Around the NW 58th
Street Landfill

C. Results of Studies

In 1986, an Endangerment Assessment (EA) was conducted, analyzing available data for the groundwater quality in monitoring wells both upgradient and downgradient of the NW 58th Street Landfill. The ranges of the contaminants found are summarized in Table 1.

The analytical data which resulted in Table 1 values were compared to the current drinking water MCLs. In 1982, the 1987 MCLs were violated for Iron, Manganese, Mercury, 1,1,2,2-Tetrachloroethane, PCB's, Silvex, and Chlorobenzene. Of these, Iron, Manganese, Methylene Chloride, and Silvex were above the 1987 MCLs in the upgradient (uncontaminated) well during at least one of the sampling rounds.

In 1983 results indicated that Iron, Manganese, Mercury, 1,1,2,2-Tetrachloroethane, Silvex, Chlorobenzene, Benzene, Methylene Chloride, and 2,4-D exceeded the 1987 MCLs for drinking water.

In 1987, the contaminants which exceeded the 1987 MCLs were Iron, Methylene Chloride, Lead, and Tetrachloroethene.

The EA then selected contaminants of concern based on the following criteria: 1) detection of the chemical in at least two samples from a well, 2) identification of at least two samples greater than the applicable standards or criteria, and 3) information about the contaminant's mobility and persistence in the environment and its toxicity. This analysis produced the following list of eight contaminants of concern: 1) Arsenic, 2) Chromium, 3) Zinc, 4) Benzene, 5) Chlorobenzene, 6) 1,1,2,2-Tetrachloroethane, 7)Trichlorethene, and 8) Vinyl Chloride. The mobility and toxicity of the contaminants of concern are summarized in the following paragraphs.

Arsenic is most toxic and most soluble in its trivalent state. This is one of the most prevalent states of arsenic found in nature. When in a reducing environment, arsenic can be volatized. Arsenic sorbs onto clays, phosphates and organic material. Some bioaccumulation of arsenic occurs, but it does not appear to biomagnify in the higher-level food chain organisms. The levels found in the groundwater downgradient from the NW 58th Street Landfill can easily be transported in the groundwater. Arsenic is carcinogenic and mutagenic.

Benzene may be biodegraded in the presence of the proper microbial population, and may be volatilized. Benzene has low sorptive properties and high solubility. There is a high potential for the transport of this chemical in the groundwater. Benzene is carcinogenic and mutagenic.

1,1,2,2 - Tetrachloroethane is a volatile organic chemical. It may adsorb onto clay particles. It is considered to be a possible carcinogen and it may be mutagenic.

Trichloroethene may be biotransformed and biodegraded. It is a very volatile chemical, with an affinity for adsorption. The transport of this chemical through the aquifer is expected to be rapid. Trichloroethene is considered to be a probable carcinogen and weakly mutagenic.

TABLE 1

RANGE OF GROUND WATER MONITORING RESULTS
NW 58th STREET LANDFILL
DADE COUNTY, FLORIDA
REM II

ıminant	Concentration Ranges (ug/l)
Y METALS	
ıminum	ND - 10,000
senic	ND - 56
rium	ND - 100
ryllium	ND - 14
ron	ND - 800
dmium	ND - 14
romium	ND - 55
balt	ND - 15
pper	ND - 100
on	50 - 51,700
ad	ND - 110
nganese	ND - 630
rcury	ND - 15
lybdenum	ND - 5
ickel	ND - 48
lenium	ND - 13
ilver	ND - 5
in	ND - 40
inc	ND - 28,000
ORITY POLLUTANTS-	
ATILE ORGANICS	
enzene	ND - 8
romodichloromethane	ND - 0.02
hlorobenzene	ND - 16
ibromochloromethane	ND - 5
1,1-Dichloroethane	ND - 17
1,2-Dichloroethane	ND - 17
1,1-Dichloroethene	ND - 3
cis-1,2-Dichloroethene	ND - 56
trans-1,2-Dichloroethene	ND - 29
Ethylbenzene	ND - 6
Methylene Chloride	ND - 9
1,1,2,2-Tetrachloroethane	ND - 5.7
Tetrachloroethene	ND - 5
Toluene	ND - 11
	ND - 1.13
	ND - 5

TABLE 1

RANGE OF GROUND WATER MONITORING RESULTS
NW 58th STREET LANDFILL
DADE COUNTY, FLORIDA
REM II

Contaminant	Concentration Ranges (ug/l)	
PRIORITY POLLUTANTS-		
ACID EXTRACTABLE ORGANICS		
4-Nitrophenol	ND -	200
Pentachlorophenol	ND -	40
Phenol	ND -	134
PRIORITY POLLUTANTS-		
BASE/NEUTRAL EXTRACTABLE ORGANICS		
Benzyl Butyl Phthalate	ND -	20
Chrysene	ND -	20
Dichlorobenzene	ND -	6
PESTICIDES/PCBs		
Chlordane	ND -	0.001
Dieldrin	ND -	0.001
DDD	ND -	0.02
DDE	ND -	0.01
DDT	ND -	0.09
2,4-D	ND -	480
Endosulfan Sulfate	ND -	0.18
Heptachlor	ND -	0.001
PCBs	ND -	830
Silvex (2,4,5-TP)	ND -	78
2,4,5-T	ND -	59
MISCELLANEOUS		
Cyanide	ND -	30
Oil & Grease	1,000 -	31,000
NON-PRIORITY POLLUTANT-		
ORGANICS		
Acetone	ND -	200
C3 Alkylbenzoic Acid	ND -	21
C2 Alkylphenol	ND -	120
Benzoic Acid	ND -	299
Carbon Disulfide	ND -	10
Chlorotoluene	ND -	30,000
1,4-Dioxane	ND -	10
Ethylether	ND -	10
Hexadecane	ND -	20

TABLE 1

RANGE OF GROUND WATER MONITORING RESULTS
NW 58th STREET LANDFILL
DADE COUNTY, FLORIDA
REM II

Contaminant	Concentration Ranges (ug/l)
NON-PRIORITY POLLUTANT-ORGANICS	
Hexadecanoic Acid	ND - 28
Methyl Acetate	ND - 30
Methyl Benzoic Acid	ND - 50
Methyl Butyl Ketone	ND - 150
Methyl Ethyl Ketone	ND - 13,000
2-Methyl Phenol	ND - 390
4-Methyl Phenol	ND - 150
Phosphoric Acid, Tributyl Ester	ND - 30
Styrene	ND - 6.3
Tetrahydrofuran	ND - 400
2,4,5-Trichlorophenol	ND - 14
Chloro Ethyl Benzene	ND - 100
Methyl Ethyl Benzene	ND - 3

ND - Not detectable.

Sources: PRC, 1986
FDER, 1987

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Vinyl Chloride is readily volatilized and exhibits a low affinity for sorption. It will move with the bulk flow of the groundwater. Vinyl Chloride is carcinogenic and mutagenic.

Many studies of the quality of the Biscayne Aquifer have been conducted, and several of the monitoring wells used in these studies are located in such a way as to be useful in defining the effect of the landfill leachate on the aquifer water quality. This is a major concern because the Biscayne Aquifer is the sole source of drinking water for Dade County.

In 1975, the U.S. Geological Survey completed a study of groundwater contamination around the NW 58th Street Landfill. The results of the sampling conducted during this study indicated the presence of a plume of contamination migrating downgradient from the landfill. The report estimated that the plume, at that time, was located about one mile east (downgradient) of the landfill. In 1982, CH_2M Hill conducted a groundwater quality study as part of the remedial investigation of the Biscayne Aquifer study area. This study included the NW 58th Street Landfill, and the results did not indicate the presence of any identifiable plume from any of the sources in the study area. Rather, the study showed widespread low to moderate levels of contaminants present in groundwater in most of the study area. In the 1987 data from FDER, where they sampled several monitoring wells around the NW 58th Street Landfill site, the low to moderate levels of contaminants are still present. This study was performed to determine the contaminants released from the landfill, not to identify a plume.

Since the data are from several wells, however, some information about the attenuation of the contaminants is available. Table 2 summarizes the analytical data for several contaminants found in the set of wells which best measure the effects of the NW 58th Street Landfill on the groundwater. The wells are identified in the Table by their distance downgradient from the landfill (Figure 2 and Table 3). There are data for three sets of sampling, defining the attenuation possibilities over time and distance.

D. Areawide Exposure Risks

The primary route for human exposure to the contamination is through drinking the water. Of major concern are the two sets of public drinking water supply wells, the Preston and Miami Springs wellfields, and a set of private-use wells which are located within 2-1/2 miles downgradient of the NW 58th Street Landfill. The population served by the public wellfields is estimated to be 750,000. The potential problem with these downgradient wellfields is the migration of contaminants into the cone of influence of drinking water supply wells. Currently, the water from downgradient wells is blended with uncontaminated water from upgradient wells, and the use of downgradient wells is minimized, thus providing safe drinking water for the public. There has been some concern, however, that the influence of the upgradient wells may cause contaminated groundwater to migrate toward them. To help insure this migration does not occur, the County has adopted a wellfield protection plan for the area.

Table 2

MAJOR CONTAMINANT CONCENTRATIONS
NW 58th STREET LANDFILL
DADE COUNTY, FLORIDA
REM II

Date	Major Contaminants	CONCENTRATIONS (ug/l)																				
		LM-1			LM-2			LM-4A			LM-5A			LM-6A			LM-8			LM-3B		
		10'	30'	60'	10'	30'	60'	20'	40'	60'	10'	30'	60'	10'	30'	60'	10'	30'	60'	15'	30'	60'
11/82	Arsenic	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Chromium	ND	ND	10	ND	ND	--	20	10	40	10	20	ND	10	20	10	ND	ND	10	ND	10	ND
	Zinc	40	30	50	ND	40	--	30	ND	10	10	10	150	ND	[illegible]	[illegible]	[illegible]	[illegible]	ND	ND	220	70
	Lead	ND	ND	ND	ND	10	--	5	ND	ND	ND	ND	ND	ND	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	ND	ND	ND
	Benzene	ND	ND	ND	ND	ND	--	ND	ND	ND	5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Chlorobenzene	ND	ND	ND	ND	ND	--	15	13	5.4	5.5	8.1	80	48	48	5.6	5.7	7.6	80	ND	58	48
	1,1,2,2,-Tetrachloroethane	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	5.7	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Trichloroethene	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	38	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Vinyl Chloride	ND	ND	ND	ND	ND	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
3/83	Arsenic	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	10	10	ND	ND	ND	ND	ND	ND
	Chromium	ND	ND	ND	10	10	ND	20	10	10	ND	ND	10	10	ND	20	10	ND	10	10	10	10
	Zinc	20	ND	20	30	30	20	40	ND	10	ND	ND	ND	20	1400	ND	ND	20	20	ND	ND	ND
	Lead	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	7.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Chlorobenzene	ND	ND	ND	ND	ND	ND	15	12	16	7.8	12	88	5.1	58	8.3	6.7	10	7.1	ND	ND	5.7
	1,1,2,2-Tetrachloroethane	ND	ND	ND	ND	ND	ND	38	38	ND	40	ND	ND	ND	ND	38	ND	ND	ND	ND	ND	ND
	Trichloroethene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	Vinyl Chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1/87	Arsenic	--	--	--	1.0	--	1.4	--	--	ND	2.0	ND	1.6	--	--	--	5.4	0.4	2.0	--	--	--
	Chromium	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Zinc	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Lead	--	--	--	50.7	--	11.9	--	--	1.9	35.2	1	12.9	--	--	--	101	24.4	19.5	--	--	--
	Benzene	--	--	--	ND	ND	ND	--	ND	ND	ND	ND	ND	--	--	--	ND	ND	ND	--	--	--
	Chlorobenzene	--	--	--	ND	ND	ND	--	10	ND	ND	6	10	--	--	--	3	3	B	--	--	--
	1,1,2,2-Tetrachloroethane	--	--	--	ND	ND	ND	--	ND	ND	ND	ND	ND	--	--	--	ND	ND	ND	--	--	--
	Trichloroethene	--	--	--	ND	ND	ND	--	ND	ND	ND	ND	ND	--	--	--	ND	ND	2	--	--	--
	Vinyl Chloride	--	--	--	ND	ND	ND	--	ND	ND	ND	ND	ND	--	--	--	ND	ND	ND	--	--	--

-- = Not analyzed for.
ND = Analyzed for, but not detected.
B = Reported as an estimated value in the CH2M-Hill (1984) Report.

SOURCES: [illegible] 1984
1987

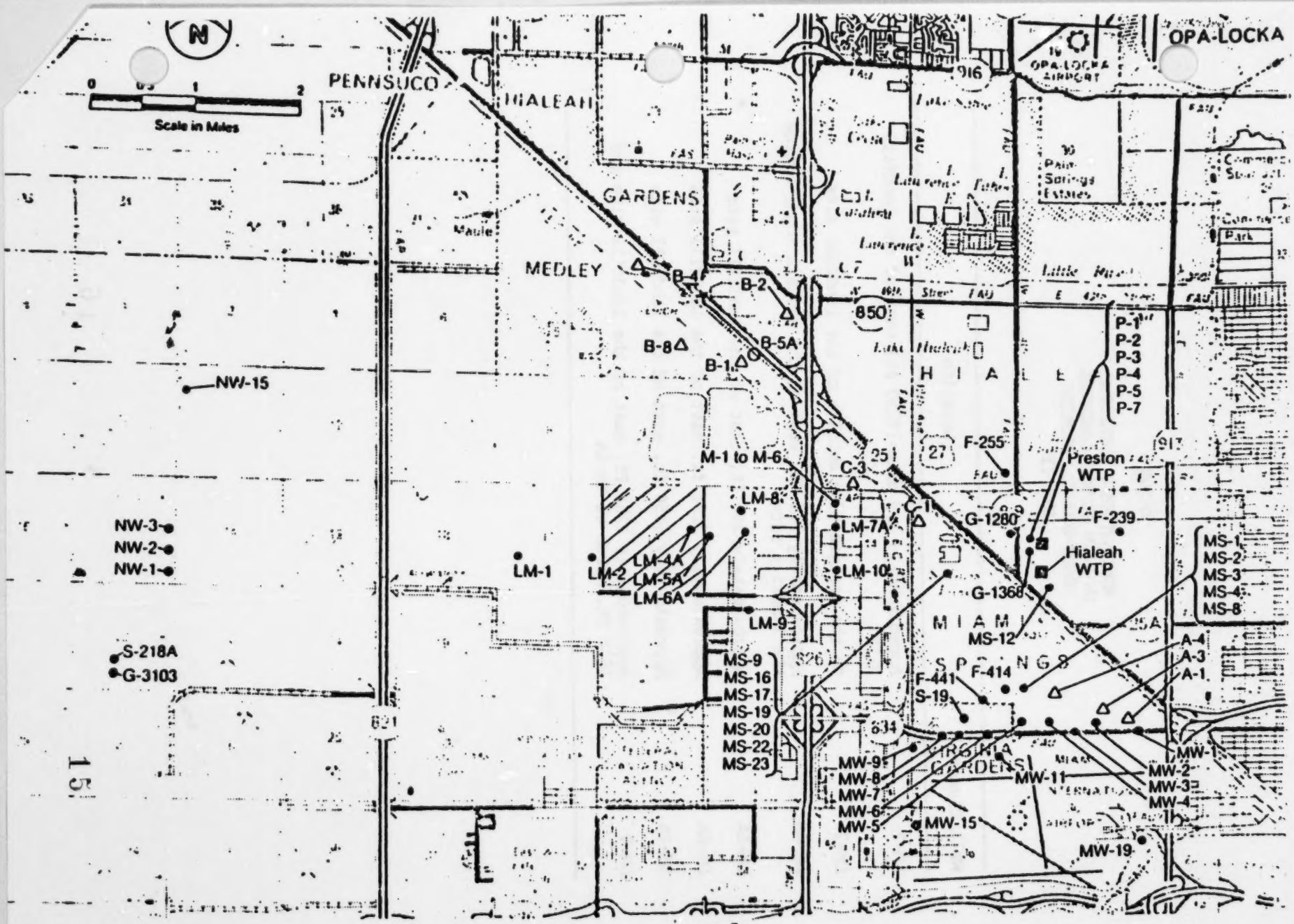

Figure 3 Location of sampling wells in study area.

TABLE 3

MONITOR WELL LOCATIONS
NW 58TH STREET LANDFILL
DADE COUNTY, FLORIDA
REM II

Well Cluster	Location
LM-1	Approximately 1.0 mile (5280 Ft) west of the landfill site
LM-2	On the western edge outside of the landfill site
LM-4A	Approximately 375 ft. west of the eastern edge, inside the landfill site
LM-5A	Approximately 250 ft. east of the landfill site
LM-6A	Approximately 2250 ft. east of the landfill site
LM-7A	Approximately 6850 ft. east of the landfill site
LM-8	Approximately 2250 ft. east of the landfill site and 2500 ft. north of LM-6A

E. Areawide Actions to Minimize Exposure Risks

The wellfield protection plan is designed to push the cone of influence of the uncontaminated Northwest Wellfield further to the west to maintain its uncontaminated state. This is be be accomplished by creating an hydraulic barrier with improvements to the existing drainage/ recharge system. In addition, the land area over the cone of influence for this wellfield will be protected from incompatible uses by zoning ordinances. Another important aspect of this plan is to decrease the pumpage rate from the uncontaminated Northwest Wellfield. Currently, this is not feasible due to the necessity to provide the cleanest possible drinking water to the public. It is anticipated, however, that the air strippers, when functioning at the water treatment plants, as described later in this document, will allow increased pumping of contaminated groundwater. The increased pumping from the contaminated wellfields will allow an equal decrease in pumping from the uncontaminated wellfield.

The Biscayne Aquifer Superfund Study is an incorporation of three National Priority List sites: Miami Drum Services; Miami International Airport (Varsol Spill); and Northwest 58th Street Landfill. All of these sites have caused some contamination of the Biscayne Aquifer. Each site represents an operable unit of the entire remedy for this study area. The Miami Drum Services operable unit involved soils and groundwater cleanup, and a Record of Decision (ROD) with a source control requirement was signed in September, 1982. In March, 1985, a ROD was signed for the Miami International Airport (Varsol Spill) operable unit, and required no action. The Study Area Ground Water (Biscayne Aquifer) operable unit ROD was signed in September of 1985. This ROD requires that air stripping be added to the existing water treatment process in the study area. It also calls for the two downgradient municipal water supply wellfields (Preston and Miami Springs) to be operated for the dual purpose of providing potable water and recovering contaminated water from the Aquifer. This system is currently in the Remedial Design phase and will treat the contamination which occurs in the cone of influence of these wellfields. The alternative selected in this (NW 58th Street Landfill) ROD will minimize future contamination of the aquifer by controlling the leachate production from this source.

While the action taken under the Biscayne ROD will treat the public drinking water supply, there are still concerns with the downgradient private (commercial) use wells in the study area. The concerns are addressed, in part, by the source control actions taken under the area RODs which have been signed as well as this ROD on the Northwest 58th Street Landfill. Dade County is addressing the concerns for the private well users by implementing special taxing districts to finance their plans to put the private-well users on public water supplies. The cost per assessable foot varies by the district involved. In one district, the assessment will be $39.73 per foot, and in another, the cost is $264.73 per assessable

foot. Once the public water is available to the district, Dade County personnel will inspect to ensure that all potable connections to the private wells are severed. The wells may still be utilized for irrigation at the discretion of the owners. Private wells to the north of the landfill within the City limits have been replaced by City water. This action has been undertaken by the cities of Hileah Gardens and Medley. All the private wells in the area of concern should be replaced by municipal water by December 1988.

The special taxing district is also being utilized for an unsewered industrial area. There is concern that the use of septic tanks in these industrial areas contribute to the areawide groundwater contamination problem. Therefore, Dade County has plans to provide sewer service to these areas by December, 1989.

III. ENFORCEMENT SUMMARY

In June, 1979, Dade County and the Florida Department of Environmental Regulation entered into a Consent Order which required the County to cease accepting waste at the NW 58th Street landfill by August 1, 1981. This date was not met. The landfill did stop accepting wastes for disposal in October, 1982, although it has never been officially closed in accordance with Chapter 17-7, Florida Administrative Code (FAC).

The Consent Order with the State is still in effect; however, a Consent Agreement with EPA will be negotiated with the County, and the State will be asked for input to the Consent Agreement. This Record of Decision requires the landfill to be closed in accordance with the technical requirements of Chapter 17-7 FAC (1985), utilizing the implementation guidance document "Covers for Uncontrolled Hazardous Waste Sites" (EPA/540/2-85/1985). Once that is accomplished, the State's Consent Order requirements will also be met.

IV. COMMUNITY RELATIONS HISTORY

In July 1984, a Community Relations Plan (CRP) was completed for the Biscayne Aquifer Site, which includes the NW 58th Street Landfill. The CRP cites the major issues and concerns with this site as: 1) Potential contamination of area drinking water supplies, 2) Comprehensive solutions for the Biscayne Aquifer sites, 3) Relationship among key parties, and 4) Coordinated flow of information. The CRP futher noted that the location and nature of the problem tends to encourage community involvement on an area-wide, rather than site-specific, basis.

The Community Relations Plan responded to the identified issues and concerns by providing public meetings to discuss ongoing work with concerned citizens. The CRP also included workshops for the key parties to get together and discuss any issues of concern. In addition, 3 mailings of a newsletter entitled "Remedies" were sent to concerned citizens and elected officials. These newsletters included updates on the sites in South Florida, summaries of results of studies conducted, and meeting announcements. Furthermore, a fact sheet entitled "Phase III Feasibility of Remedial Actions for the Protection of the Biscayne Aquifer, Dade County, Florida" and an executive summary entitled "Recommendations to Clean Up and Protect the Biscayne Aquifer in Southeast Florida" were printed and distributed. The media in South Florida were also invited to many of the meetings, and press releases were issued periodically. In addition, information has been made available to the public by deposition of copies of documents placed in the Florida Reference section of the downtown Miami-Dade County Public Library.

On October 25, 1983, a meeting was held to discuss the results of sampling the groundwater in South Florida. During this meeting the results of the Remedial Investigation and a list of preliminary alternatives were presented.

On March 20, 1984, a public meeting was held during which the results of the initial screening of alternatives were presented, as well as the detailed analysis of the remaining alternatives.

On July 17, 1984, a public meeting was held for comments on the Feasibility Study and the recommended alternative. Two workshops on study findings, risk assessment, and proposed cleanup and prevention activities were held for the press, local officials, and the general public.

On February 7, 1985, a public meeting was held to discuss the results of the Feasibility Study. At the meeting, it was stated that EPA would accept written comments on the results of the Feasibility Study until February 28, 1985. No written comments were received throughout the comment period. The attached responsiveness summary deals with issues brought up in the public meeting on February 7, 1985 (Attached).

V. ALTERNATIVES ANALYSIS

The Feasibility Study considered several alternatives applicable to the Northwest 58th Street Landfill site. These include:

1) No Action.

2) Onsite Groundwater Recovery Wells with Treatment Prior to Discharge.

3) Onsite Groundwater Recovery Wells with Deep Injection Well Disposal.

4) Containment of Contaminants.

5) Excavate the Landfill.

6) Leachate Control Measures.

Each alternative was evaluated using the Evaluation Factors in Section 121 (b)(1) (A-G), of the Superfund Amendments and Reauthorization Act as well as whether or not it attains the applicable or relevant and appropriate requirements, which are described in Table 4.

1). No Action.

The "No Action" alternative provides no source control, so the landfill will continue to contaminate the groundwater unchecked. It does not provide toxicity reduction, nor does it act to protect the community from exposure to the contamination. This alternative does not reduce the migration potential or the volume of leachate.

Attenuation must be considered under the no action alternative. The data on this site indicate the groundwater contamination in the Biscayne Aquifer study area (including the NW 58th Street Landfill) is low to moderate in level and widespread. Although a plume of contamination was identified and attributed to the NW 58th Street Landfill by the USGS in 1975, no such plume was identified in the 1983 study conducted as part of the remedial investigation. This study identified low to moderate contamination as a generalized condition of the groundwater in the study area. In results of sampling conducted by the Florida Department of Environmental Regulation in 1987, a similar condition was evident.

Table 2 allows a ready comparison of the effects of attenuation on several contaminants. It compares the contaminants in the time parameter as well as in a distance downgradient parameter. No pattern of attentuation is noted. Therefore, the no action alternative will not provide attentuation of the contaminants.

TABLE 4

APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Requirement	Substance
1. Chapter 17-7 FAC (1985)	Resource Recovery and Management
2. Chapter 17-4 FAC	Permits
3. Chapter 17-3 FAC	Water Quality Standards
4. Chapter 17-25 FAC	Stormwater Discharge
5. Chapter 17-28 FAC	Underground Injection Control
6. 40E-4, Rules of the South Florida Water Management District	Stormwater Controls
7. 40E-3, Rules of the South Florida Water Management District	Monitoring Well Design and Construction
8. Section 24-11, Metropolitan Dade County Code	Groundwater Standards
9. Section 24-58, Metropolitan Dade County Code	Permitting
10. Solid Waste Disposal Act	Landfill Closure
11. Resource Conservation and Recovery Act - Subtitle D	Nonhazardous Landfill Closure
12. Clean Water Act	Water Quality
13. Safe Drinking Water Act	Drinking Water Quality
14. Clean Air Act	Air Emissions Control
15. National Oil and Hazardous Substances Pollution Contingency Plan	Remedy Evaluations/Selection

This alternative is technically feasible and applicable but it does not meet the goals established for this site. There are no costs for implementation of this alternative.

2). Onsite groundwater recovery wells with treatment prior to discharge.

The treatment process considered in the "Evaluation of Alternatives Memorandum for the NW 58th Street Landfill Site", consisted of recovery wells pumping the contaminated groundwater from the aquifer to a two-stage treatment process. The treated groundwater is then reinjected into the aquifer, creating an hydraulic barrier to contaminant migration.

The first stage of the treatment system is a chemical/physical process for the removal of metals. The effluent from this process would then be directed to an air-stripping system for the removal of volatile contaminants.

This alternative does allow for the collection and treatment of the leachate, thereby reducing the toxicity and controlling the migration of the groundwater. The reliability of this system is anticipated to be good, and it is technically feasible and applicable to this site.

A major concern is with the useful life of the physical and mechanical equipment as well as the wells themselves. It can reasonably be anticipated that this system will require replacing at some time in the future since it does not provide for the reduction of leachate production.

The present-worth cost estimate of the capital and 30 year operation and maintenance of this system is $3.9 million. This cost breaks down into:

Construction Costs - $2.5 million (present worth)
30-year O&M Costs - $1.4 million (present worth)

The proposed system will not meet Chapter 17-7 Florida Administrative Code requirements for landfill closure and therefore, in addition to the money expended for this system, a landfill closure will be required. Another consideration is that the downgradient drinking water wells already act as recovery wells for the contamination in the Biscayne Aquifer. Since the aquifer is contaminated by sites in addition to the NW 58th Street Landfill, this alternative will not alleviate the requirements for the treatment of the aquifer water withdrawn by the public wells. Another concern is the downgradient private well users. This alternative does not alleviate that problem.

3). Onsite groundwater recovery and deep injection well disposal.

This alternative involves pumping out the contaminated groundwater underneath the landfill and pumping (injecting) it into a deep aquifer of sea water quality. The Feasibility Study estimated that a depth of 3,000 feet for the deep injection well is necessary. To assure reliability and continuous operation, a second injection well would be installed as a backup.

This process is technically feasible; however, the applicability of the process to the NW 58th Street site is questionable. The groundwater contamination level has been found to be consistently low in all studies conducted in the aquifer. In fact, with proper treatment, this water could be used for drinking water. Therefore, deep injection disposal of this contaminated groundwater does not appear to be an appropriate action.

This alternative does allow for the collection and disposal of the leachate in the groundwater, thereby reducing the toxicity and controlling the migration of the groundwater. However, since no action to stop the production of leachate would be taken, the equipment would need to operate indefinitely. Thus, it is necessary to consider the useful life of the mechanical and physical equipment, as well as the wells themselves. It is reasonable to assume that they will need to be replaced at some time in the future.

The present-worth cost estimate of the capital and 30 year operation and maintenance of this system is $5.0 million. This breaks down into:

Construction Costs: $4.5 million (present worth)
30-year O&M Costs: $0.5 million (present worth)

This system would not meet Chapter 17-7 Florida Administrative Code requirements for landfill closure. Therefore, in addition to the money expended for this system, a closure would be required. Another consideration is that the downgradient drinking water wells already act as recovery wells for the contamination of the Biscayne Aquifer and could be used as a more cost effective recovery system. Since the aquifer is contaminated by sites in addition to the NW 58th Street Landfill, this alternative will not alleviate the requirement for the treatment of the aquifer water withdrawn by the public wells. Furthermore, the private wells downgradient from the landfill are not addressed in this remedy.

4). Onsite containment of contaminants.

The Feasibility Study (FS) cited examples of grout curtains, slurry walls, and sheet pile walls for onsite containment. The FS then questioned the technical feasibility and constructability of this alternative. Some of the concerns in a system of this type would be the depth to which the barriers would need to be placed (to the base of the aquifer, 60-90 feet), the fast-moving nature of the aquifer (2-4 feet per day), and the cavernous nature of the aquifer. These concerns also bring the applicability and reliability of the alternative into serious doubt.

Due to the doubts concerning the technical feasibility and constructability of the processes included in this alternative, no cost analysis was conducted, and this alternative is rejected from further consideration based on technical infeasibility and non-constructability.

5). Excavate/Dispose of the Landfill.

This alternative involves the excavation of nearly 27 million cubic yards of landfill material. There are many health and technical feasibility questions regarding this option. The present worth estimate of the cost of excavation alone is $439 million. Since this is two orders of magnitude higher than the other alternatives that would provide comparable protection, this alternative is rejected on the basis of cost.

6). Leachate Control Measures.

This alternative will include some combination of capping, grading, drainage control, and leachate collection. The specific actions considered in the "Evaluation of Alternatives Memorandum for the NW 58th Street Landfill Site" are cover, grading, and drainage control. This alternative would also provide a monitoring plan to assess long term reliability and to serve as an early warning system. Longterm O&M of the implemented alternative will be required, as will controls for gas migration and odors.

This plan will minimize leachate production by redirecting the rainfall which would otherwise percolate through the landfill. This is a technically feasible and applicable solution. It does provide for long-term protection of the groundwater, although it does not address the groundwater contamination at the present time. Since the landfill is unlined, some leachate generation will always occur at this site; however, a significant portion will be eliminated. In addition, the groundwater will flush the same parts of the landfill with each high water cycle, and so should result in decreasing contamination of the aquifer over time.

This alternative acts to decrease the volume and (in time) the toxicity of the leachate. It will not affect the migration of the leachate which does form. However, downgradient public drinking water wells will act to recover contaminated water from the Aquifer. This is addressed in the Biscayne Aquifer ROD, which requires air strippers to treat the drinking water before distribution. Another concern is the downgradient private-use wells. These will be addressed by Dade County. The solution will include providing public drinking water to the affected area.

This alternative meets the technical requirements for landfill closure in Chapter 17-7 Florida Administrative Code, (1985).

The estimated present-worth cost of this alternative is $7.0 million. This breaks down into:

Construction Cost: 5.5 million (present worth)
30-year O&M Cost: $1.5 million (present worth)

VI. SELECTED REMEDY

The NW 58th Street Landfill Record of Decision includes controlling leachate generation at the landfill and supplying alternate drinking water to selected areas. The selected remedy calls for the landfill to be closed in accordance with Chapter 17-7 Florida Administrative Code (FAC)(1985). Table 4 is a summary of the applicable or relevant and appropriate requirements on the County, State, and Federal levels. Chapter 17-7 FAC (1985) has emerged as a primary regulation of concern in this Record of Decision. The National Contingency Plan (sections 300.6 and 300.7) identifies potential remedies for sites on the National Priorities List and so it is clearly applicable to this site. In addition, since the Biscayne Aquifer is the sole source of drinking water for Dade County, the Safe Drinking Water Act and Chapter 17-3 (FAC) are of great importance. The groundwater quality underneath and downgradient from the landfill violates some of the MCLs for drinking water. However, before distribution to the public, the groundwater is treated by traditional lime-softening and sedimentation/ filtration techniques at water treatment plants, and the Study Area Ground Water remedial action as required in the ROD (1985) will provide air stripping to bring the remaining chemicals of concern into compliance with the MCLs.

Chapter 17-7 FAC (1985) requires that leachate from landfills be minimized by controlling the infiltration of stormwater. This will be achieved by a combination of grading, drainage control and capping. It also requires all closure plans to provide a groundwater monitoring system and stormwater control. Methods for monitoring gas migration and odors will be included, and implemented if necessary. Chapter 17-7 FAC (1985) requires longterm monitoring of the system in use for leachate minimization as well as for groundwater monitoring. EPA has incorporated the guidance for the evaluation of remedies into documents specific to the remedy. The remedy for this site consists of landfill closure. The EPA document "Covers for Uncontrolled Hazardous Waste Sites" (EPA/540/285/002) is the applicable and relevant and appropriate document to guide the implementation of this remedy under CERCLA. This document provides guidance for the designer and the evaluator when implementing Sections 300.6 and 300.7 of the NCP. The CERCLA guidance can be an effective implementation tool when designing under the FAC Chapter 17-7 (1985) regulation. Together, they provide the appropriate regulatory requirements (Chapter 17-7 FAC (1985) with the appropriate design criteria and evaluation procedure (EPA/540/2-85/002) for the remedy.

Another major area of concern is the downgradient private well users. The Feasibility Study identified approximately 60 downgradient wells which were affected by the groundwater contamination from the landfill. The ROD addresses this problem by requiring that these private well users be provided with a public water supply. Dade County is already addressing the problem by implementing a special taxing district encompassing the private well users. This taxing district is designed to generate the revenue necessary for Dade county to supply the area with a public water supply. It is anticipated that this will be accomplished by the end of 1988.

Dade County has contracted with Brown and Caldwell Engineers to prepare the closure plan for this site. The current schedule calls for this plan to be completed by February 1988. The consultants are considering several different combinations of grading, drainage control, and capping to design an optimal solution.

The Endangerment Assessment identified several possible pathways for exposure to the contaminants at the site. Possible air emission of methane gas was cited as one route of exposure. Direct contact was also listed as a possible pathway, but the pathway of greatest concern is the ingestion of contaminated water. The selected remedy will address all of the exposure pathways of concern. A Chapter 17-7 Florida Administrative Code (1985) closure will require methane control (if needed) and the required landfill cover will eliminate the possibility of direct contact. Leachate control (cover, grading, capping, etc), will minimize the production of leachate. The downgradient private well users will be provided with municipal water. The water withdrawn from the aquifer for the municipal supply will be treated by air stripping currently scheduled for installation at the municipal water treatment plants (Biscayne Aquifer area-wide groundwater ROD September, 1985). Thus, the selected remedy addresses all of the exposure pathways and is protective of human health and the environment.

The landfill will continue to leach due to groundwater intrusion. However, minimizing stormwater infiltration will significantly reduce the volume of leachate produced. Over time, as the groundwater flushes out the same area of the landfill and rainfall infiltration into the landfill is minimized, it is likely that the quality of the leachate from the landfill will improve.

Although this alternative is slightly more costly than most of the other alternatives considered, it is the most cost-effective solution which will achieve compliance with the landfill closure requirements of Chapter 17-7 FAC (1985) and utilize a technically feasible and implementable remedy. Brief descriptions of the other alternatives considered are contained in Table 5. Only one other alternative would meet the requirements of Chapter 17-7 FAC (1985), and that is to excavate and dispose of the landfill. The cost of this alternative, along with the health concerns and technical feasibility questions, prohibits selection of this alternative as the final remedy. The remaining alternatives did not meet Chapter 17-7 FAC (1985) requirements for landfill closure.

The community comments to the Feasibility Study expressed concern that the landfill be closed and cleaned up. As that is the required action in this Record of Decision, community support is expected to be widespread.

As stated earlier, the landfill closure plan is scheduled for completion by February, 1988. The remainder of the schedule is to be negotiated into a Consent Order in the first quarter of FY '88. The negotiations will involve EPA, FDER and Dade County.

COMMUNITY RELATIONS
RESPONSIVENESS SUMMARY
BISCAYNE AQUIFER SITES
FEASIBILITY STUDY

INTRODUCTION

EPA held a public meeting on February 7, 1985 at the Miami Springs City Hall to discuss the Feasibility Study (FS) report for the Biscayne Aquifer site and to accept public comment. The meeting, held from 7:30 to 11:00 p.m., was attended by 34 people.

James Orban, EPA's site manager for the project, chaired the meeting. He was assisted by Udai Singh and Ken Cable from CH2M HILL, EPA's technical consultant. They provided a brief description of the site history, the nature of the problem and the findings of the Remedial Investigation (RI). This was followed by a more detailed presentation of the cleanup alternatives considered and the recommended actions.

Mr. Orban then requested questions and comments from the audience and stated that EPA would also accept written comments until February 28, 1985. He indicated that all comments would be considered in the decision making process and that a written response to the comments would be included in the Record of Decision.

SUMMARY OF PUBLIC COMMENT AND AGENCY RESPONSE

Questions and comments offered at the meeting are summarized below. They are divided into three categories: general comments relating to the project as a whole, those pertaining to specific sites, and those concerning recommended cleanup activities for the area's groundwater. No written comments were received during the public comment period.

GENERAL COMMENTS/QUESTIONS

1. Public Involvement: Speakers thought that public notice for the meeting was inadequate, that there had not been sufficient involvement of citizens during the study process, and that the plans had been prepared "behind closed doors".

   Response: Public notice for the meeting was provided by display advertisements in the Ft. Lauderdale News and the Miami Herald. A press release announcing the meeting was distributed to all local newspapers. The RI and FS reports were available for public review at the Palm Beach, Dade and Broward County offices. EPA

had previously implemented an extensive community relations program for the site.

A public meeting was held in September 1982 to present the results of the initial study and to outline the plans for Remedial Investigations. Three issues of Remedies, a newsletter summarizing project activities and reports, were mailed to over 400 individuals and organizations in October 1983, March 1984 and July 1984.

A public meeting to present the Remedial Investigation findings, outline the Feasibility Study activities, and solicit comments on possible cleanup alternatives to be evaluated was held in October 1983. Preliminary results of the detailed evaluation of the remedial action alternatives were explained in a public meeting in March 1984. Also presented for comments and suggestions at this meeting was the preliminary outline of the program for the protection of the Biscayne Aquifer.

EPA sponsored another public meeting in July 1984 to present and receive public comment on the recommended alternatives and the Biscayne Aquifer Protection Plan. Two workshops on study findings, risk assessments, and proposed cleanup and prevention activities were held for the press, elected and appointed officials and the general public during July 1984. EPA believes these activities provided excellent opportunities in both formal and informal settings for two-way communication between interested citizens and the agencies: EPA, Florida Department of Environmental Regulation, Dade County Department of Environmental Resources Management, and the Centers for Disease Control.

2. Funding for Cleanup: Questions concerned the availability of EPA funds for implementation of cleanup activities, private sector responsibility for cleanup, and incentives to encourage private sector site cleanup. Commentors indicated that water user charges should not be used to fund cleanup actions.

   Response: EPA has identified the responsible parties, and will influence these parties to do what is necessary to cleanup the site. EPA will also use available Superfund monies to implement the cleanup.

3. Local Agencies: Speakers expressed a lack of confidence in the ability of county agencies to deal with hazardous waste issues. They were critical of the County's hydrocarbon removal operation at the airport, the lack of technical training of Dade County

Department of Community Affairs staff, inaccuracies in the County's report on Munisport landfill, operation of the 58th Street landfill, and the lack of information about contamination on the west side of the airport.

Response: EPA pursued the Remedial Investigation and Feasibility Study for the Biscayne Aquifer and made recommendations for cleanup activities under the authority of the Superfund program. Expenditure of program funds is limited to cleanup of existing uncontrolled hazardous waste sites and cannot be extended to cover costs of developing and implementing plans designed to prevent the occurrence of future hazardous waste disposal problems. These are responsibilities of local agencies.

4. Federal Agencies: Commentors indicated that the process for study and cleanup of sites takes too long, and that EPA should have proposed an Environmental Impact Statement (EIS) on the use of wetlands near the Northwest well field for industrial development.

Response: EPA recognizes that the length of the Remedial Investigation and Feasibility Study process causes frustration among local residents who are concerned about the effects of the sites on their health and property values. Yet, if the problems are to be effectively solved it is essential that they be thoroughly understood before long term cleanup actions are recommended. At Biscayne Aquifer, this required extensive testing at a number of different sites and evaluation of 12 source control and 10 offsite remedial action alternatives. These activities were accomplished as expediently as possible.

Responsibility for implementation of an EIS rests within a different division of EPA. Officials will refer the request to the appropriate section within EPA for further consideration.

SITE SPECIFIC COMMENTS/QUESTIONS

1. Varsol Spill Site: Commentors thought the presence of hydrocarbons at the airport site should have been a target for Superfund action.

Response: As the speaker indicated, hydrocarbons are not included in the list of hazardous substances regulated by the Superfund program. The project studies did assist the State and local officials in identifying and addressing the problem. However, formal Superfund action is not appropriate.

Over 1.5 million gallons of Varsol were believed to have been spilled at the site in 1968. EPA conducted an extensive sampling program at the site, but was unable to confirm the presence of a plume of toxic substances. It is possible that the solvent was biodegraded or dispersed through the aquifer.

2. Miami Drum Site and 58th Street Landfill:

   a. Speakers suggested that EPA in its RI did not identify a contaminant plume at the 58th Street landfill because it did not have much concern about contaminant migration since the adjacent Miami Springs well field is only used as a back-up water supply source.

      Response: The presence of a contaminant plume in groundwater downgrade of the 58th Street landfill was documented in the late 1970s by the U.S. Geological Survey and various studies by consultants; however, that was a non-toxic, non-organic substance survey. Between November 1982 and March 1983 EPA conducted a more comprehensive survey; a series of six sampling programs which tested for all 129 priority pollutants, including organic as well as inorganic toxic substances.

   b. Speakers thought EPA's focus on municipal drinking water and groundwater was too narrow and did not permit sufficient consideration of problems that require attention at these sites. They were concerned about cleanup and closure of the 58th Street landfill and felt these activities should be included as recommended remedial actions.

      Response: EPA considered a wide range of alternatives for remedial action at the sites, related both to specific sources of contamination as well as to the offsite, area-wide nature of the problem. EPA did include in the FS an analysis of remedial alternatives for the 58th Street landfill, including proper closure.

RECOMMENDED ACTION COMMENTS/QUESTIONS

1. Recommendation Development: One speaker questioned the process of developing recommendations for cleanup actions and indicated he did not feel the recommendations covered all problems identified by project studies. He suggested consideration of a variation of Alternative 3 that would keep Preston and Miami Springs well fields open for emergency back-up

and would implement plans to minimize future contamination in the Miami Springs area.

Response: EPA performed a detailed evaluation of Alternative 3 and found that it was not cost-effective (the total present worth cost for Alternative 3 was over $23 million as compared to the cost of the recommended alternative; $8.5 million). Alternative 3 also would not satisfy one of the important goals of the study; to cleanup the aquifer, which will be accomplished by pumping from the Miami Springs and Preston well fields.

2. Biscayne Aquifer Protection Plan: Speakers identified the need for federal protection of wetlands in the Northwest well field area. They suggested preparation of an EIS or use of EPA's veto power over Corps of Engineers' 404C permits to control land development near the new Northwest well field.

Response: The suggested actions are not within the domain of the Superfund branch at EPA. Officials will refer this recommendation for consideration to the proper division within EPA.

3. Air Stripping: Commentors were concerned about the health effects of airborne pollution on people living near the proposed tower sites. They asked about the benefits of air stripping and the end result of the remedial action on water quality.

Response: EPA completed a detailed estimate of air pollution resulting from air stripping towers and found that air stripping meets all state air emission requirements and is far below allowable air emission limits. It will not have adverse impacts upon the environment or human health. The benefit of air stripping is that it will be removing 97 percent to over 99 percent of the volatile organic compounds from the water withdrawn from the Miami Springs and Preston municipal well fields, thus considerably improving the quality of potable water in the study area.

4. Effect on Land Values: One speaker was concerned about the effect of the cleanup activities on land values in her Miami Springs neighborhood. She wanted to know the effect of the recommended alternative on her property value.

Response: The Miami Springs and Preston well fields had been pumping for 20 to 30 years, artificially lowering the water table in the area. When pumping began at the new Northwest well field and the Miami

Springs and Preston well fields were shut down, the water table in the area rose, causing flooding of residential properties.

EPA's recommendation is to begin pumping the Miami Springs and Preston well fields, and to treat the water by air stripping so as to provide clean water to the public. Although this study was not meant to address the flooding problem at the sites, the effect of the recommended action is to return the water table to its former position, thus resolving the flooding problem.

WDR91/001

RECORD OF DECISION
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
BISCAYNE AQUIFER SITES, DADE COUNTY, FLORIDA

BACKGROUND

INTRODUCTION

Three sites proposed for the National Priorities List in October 1981 are located in northwest Dade County, Florida. After consulting with the State and County, EPA decided to address these sites as a single management unit for the performance of the RI/FS. A major reason for this decision is that all three sites affect the same general area of the Biscayne Aquifer. The agencies recognized that the effects of these sites on the aquifer could be interrelated and that some of the problems believed to exist would not be solely attributable to an individual site. This management scheme worked well for the RI/FS and is also appropriate for the remedy.

A package of five Records of Decision (RODs) that address the three sites is planned. One ROD was signed on September 13, 1982, for the Miami Drum source control. The second ROD (Varsol) is included herein. This ROD package will be completed in phases with the final ROD (Phase IV) planned for fall 1985. In general, the RODs are as follows:

Phase I: Varsol Spill Site--immediate area soil and groundwater

Phase II: Miami Drum--immediate area groundwater

Phase IIa: Miami Drum--source control (soils and encountered groundwater), completed September 1982

Phase III: 58th Street Landfill--immediate area soil, surface and groundwater

Phase IV: Groundwater in three-site area

SITE LOCATION AND DESCRIPTION

The Biscayne Aquifer is the sole source of drinking water for three million residents of southeast Florida. Three Biscayne Aquifer hazardous waste sites on the EPA National Priorities List were addressed as one management unit for remedial investigation and feasibility study: (1) Varsol Spill Site (Miami International Airport), (2) Miami Drum

Site, and (3) Northwest 58th Street Landfill. These sites are located close to each other in north Dade County, Florida. The study area including these sites is defined in Figure 1. Locations of these sites and public well fields as well as private wells within the study area are shown in Figure 2. The topography in the study area is flat, approximately 5 feet above sea level.

The Varsol Spill Site is located in the northeast section of Miami International Airport (MIA). The airport is located less than one-half mile south of the lower Miami Springs municipal well field. The Miami Canal runs adjacent to the northeast corner of the airport, the Tamiami Canal runs immediately south of the airport, and two other canals are located near the western edge of the airport.

Miami Drum Services was an inactive drum recycling facility located west of Miami Springs at 7049 N.W. 70th Street in Miami. The dimensions of this site are 242 feet (north-south axis) by 230 feet (east-west axis), and it is located in a predominantly industrial area. The FEC Canal is located about one quarter of a mile east of the Miami Drum Site, and the Miami Canal is located less than one mile northeast of the site. The Medley well field is located approximately 750 feet west of this site, while the Miami Springs and Preston well fields are located about 5,000 feet southeast of the site.

The Northwest 58th Street Landfill consists of a one-square-mile area near the western perimeters of the Town of Medley and the City of Miami Springs. Present development adjacent to this landfill site consists of industrial uses to the south (Northwest 58th Street) and east (Northwest 87th Avenue), a rock pit operation to the north (Northwest 74th Street), and undeveloped land to the west (Northwest 97th Avenue). A new resource recovery plant is located directly west of, and adjacent to, the landfill. The Medley and Miami Springs municipal well fields are approximately one and one-half miles and two and one-half miles downgradient from the eastern edge of the landfill, respectively.

The average annual rainfall over the study area is approximately 60 inches, of which as much as 80 percent falls during the rainy season (June to September). Parts of the study area are inundated intermittently during the rainy season, and swampy conditions persist for several weeks each year, mainly due to rising water table. The major drainage systems of the area are the Miami and Tamiami Canals draining into the Biscayne Bay. The secondary drainage systems include the 58th Street, Dressel, and 25th Street Canals. The water table beneath the study area is located approximately 2 to 3 feet below the natural land surface.

The Biscayne Aquifer, which is a highly permeable, wedge-shaped, unconfined shallow aquifer composed of limestone and sandstone, underlies the study area. The top of the aquifer is near the natural ground surface, and its base is approximately 60 feet below ground surface in the Northwest well field area and approximately 105 feet below ground surface in the Miami International Airport area. Figure 3 shows the geologic section of the Biscayne Aquifer in the Miami Springs/Preston well field area. In general, this aquifer is divisible, from top to bottom, into three distinct water-producing zones, each zone being 15 to 20 feet thick. These zones are separated by generally dense, silty to sandy limestones and well-cemented quartz sands that act as aquitards. The cone of depression resulting from the withdrawal of approximately 150 million gallons per day (mgd) of water from the Miami Springs and Preston well fields encompasses the northern half of the Airport, all of the Miami Drum Site, and extends as far west as one-half mile east of the 58th Street Landfill. The cone of depression corresponding to a drawdown of 0.25 foot that results from the withdrawal of 150 mgd of water from the new Northwest well field and 75 mgd of water from the Miami Springs well field encompasses the western edge of the 58th Street Landfill.

SITE HISTORY

Varsol Spill Site

Industrial operations associated with a typical commercial airport have resulted in hydrocarbon contamination of surface and groundwaters in the vicinity of MIA. Since 1966, approximately 15 hydrocarbon spills and leaks have been recorded. The total discharge of hydrocarbon materials is estimated to be approximately 2 million gallons. This includes the loss of an estimated 1.5 million gallons of varsol discovered at the Eastern Airlines maintenance base in the northeast section of the airport around 1970. During 1970 a jet fuel spill of approximately 66,000 gallons was discovered near the west central area of Eastern Airlines properties. In 1970, National Airlines accidentally spilled an unknown amount of jet fuels into the drainage canals that ultimately discharge into the Tamiami Canal. They were ordered to stop discharging cleaning solvents and degreasers to an airport drainage canal at this time. In 1981, Braniff Airlines was ordered to stop this same practice after it was discovered. Several other smaller spills and discharges of jet oil, aviation gas, cleaning solvents, and degreasers have also occurred at the airport. Several areas within MIA have heavy accumulations of oil lying on the ground. This is often the result of employees from various aircraft

maintenance operations discharging oily wastes onto the ground and into storm sewers. Another major underground jet fuel spill was discovered in 1983 in the vicinity of Concourse E as a result of ongoing construction and improvements in the area.

Removal of underground hydrocarbons at the airport was attempted in the early 1970's primarily at the Eastern Airlines maintenance base. Hydrocarbon decontamination separator trenches were installed by Eastern Airlines in 1971 to remove the 1.5 million gallons of varsol that had spilled underground. The recovery operations were terminated in August 1973 due to slime build-up in the trenches and the extremely slow natural migration of hydrocarbons into the trenches. Actual recovered volumes were approximately 133,000 gallons of hydrocarbons, or less than 10 percent of the estimated spill volume. Other recovery procedures at the airport have been implemented only in conjunction with dewatering operations at construction sites within the airport and have been unsuccessful in removing substantial quantities of hydrocarbons. During April 1981, construction activities in the west-central area of the Eastern Airlines maintenance base revealed a thick hydrocarbon layer floating on the water table in an excavated trench, probably from previous fuel spills. Eastern Airlines installed 54 shallow observation wells during the early 1970's at their maintenance base (the general area of the varsol spill). Measurements of fluid levels in these monitoring wells, specifically the water-table depth and hydrocarbon thickness in the upper layer of the water table, were taken twice per year, during the dry season and the wet season, from 1975 to 1981. The hydrocarbon layer thickness, according to these data, shows a declining trend with time, and, in some wells, the presence of the layer could not be detected in the second year. In the Concourse E area, Dade County installed 43 monitoring wells to determine the extent and magnitude of jet fuel spilled. Dade County also installed three recovery wells in the Concourse E area and started the recovery operation in mid-1983. Through May 1984, over 102,000 gallons of jet fuel had been recovered from this area. Recovery operations are continuing in this area.

Miami Drum Site

The privately-owned Miami Drum Services (MDS) facility operated for approximately 15 years before Dade County, through a local court order, forced MDS to cease operation in June 1981. As many as 5,000 drums of various chemical waste materials, including corrosives, solvents, phenols, and toxic metals, were observed on the site while the

company was operating. Drums were washed with a caustic cleaning solution, which, along with drum residues containing industrial solvents, acids, and heavy metals, was disposed of onsite in open, unlined pits. Eventually, the surface soils on the site became saturated.

The abandoned Miami Drum Site was acquired by Dade County for construction of the Palmetto Yard maintenance facility of the Dade County Rapid Rail Transit Project. Based on a brief study, extensive soil borings were performed at the site during December 1981 and cores up to 10 feet deep were analyzed for contaminants. Dade County contracted O. H. Materials Company and directed them to remove the 400 to 500 existing drums from the site, excavate contaminated soils based on these analyses, and relocate them to an existing, approved disposal facility. In addition to this action, the contaminated water encountered during excavation was removed, treated, and disposed of onsite. At the present time, the maintenance facility of the Dade County Rapid Rail Transit system is operating at this site.

Northwest 58th Street Landfill Site

This landfill is owned by Dade County. It began operation in 1952 as an open dump. Some waste was placed into shallow trenches dug below the water table, resulting in deposition of some refuse in the saturated zone of the aquifer. Open burning of waste was used as a volume reduction method until 1960, when a ban was placed on such burning. Since the ban, waste has accumulated at a rate approximately three times the 1960-61 rate. Since its startup in 1952, this facility has received from 100,000 to 1,000,000 tons per year of municipal solid waste. Garbage from domestic and industrial sources comprises about 65 percent of the wastes disposed of at the site. The remainder is from other sources and includes street debris, discarded autos and appliances, furniture, tree trimmings, liquid wastes, and other rubbish. The estimated recent disposal rate (applicable through July 1982) for garbage and trash was about 90,000 tons per month; for liquid wastes, consisting mainly of grease trap pump-outs, it was about 200,000 to 400,000 gallons per month. Since January 1975, this landfill has been receiving daily cover provided by muck and crushed rock from quarry overburden and, more recently, calcium carbonate sludge from the Miami Dade Water and Sewer Authority water treatment plants. Since September 1982, the landfill has been closed for all purposes, except for the disposal of construction debris.

This site is not permitted as a sanitary landfill by the Florida Department of Environmental Regulation (FDER). According to preliminary close-out plans for the landfill,

it is classified as an open dump and has been operating in violation of a consent order between the FDER and Metro Dade County dated July 30, 1979. Final close-out plans for this landfill are being prepared at this time.

CURRENT SITE STATUS

The initial study, conducted in 1982, involved compiling and evaluating existing data relevant to the contamination problem. This evaluation generally indicated the presence of dispersed, low-level concentrations of numerous toxic contaminants in the groundwater beneath the study area. This was based on limited pertinent data, mostly inorganics. A general lack of pertinent groundwater monitoring data, especially organics, was found.

The Remedial Investigation (RI), begun in late 1982, consisted of a unified, planned, and intensive sampling effort to fill in the data gaps found in the Phase I study and to determine the magnitude and extent of groundwater contamination. Criteria for data classification were developed from existing literature, and were based on effects to human health. Data evaluation based on the RI indicated that widespread low to moderate levels of several toxic contaminants, mostly in the volatile organics category, are present in groundwater throughout the study area. Vinyl chloride was the most common contaminant detected and its concentration exceeded the FDER standard of one ug/l (set in 1984). No concentrated priority pollutant plume could be found.

Earlier investigations by Eastern Airlines, based on varsol fluid level measurements on top of the water table, showed declining thickness of the varsol layer with respect to time. By 1981, most of Eastern Airlines data showed no hydrocarbon thickness at the Varsol Spill Site. The RI in 1982 and 1983 did not find any plume or pockets of the varsol in groundwater at and around the spill site and in the neighboring lower Miami Springs area.

In late 1981 (prior to cleanup of the contaminated soils), the Florida Department of Environmental Regulation (FDER) contracted with Technos, Inc., to determine the extent of groundwater pollution associated with the Miami Drum Site. Geophysical measurements using electromagnetics (EM) and ground penetrating radar (GPR) provided the data for this study. The EM results showed a significant conductivity anomaly coincident with the site. The conductivity anomaly provided evidence of a strong plume-like trend to the southeast in the direction of groundwater flow and towards the Miami Springs/Preston well fields. Several less significant conductivity lobes were also detected towards

the west and north of the site toward the Medley well field. However, the RI as well as a separate remedial investigation conducted during 1983 by FDER at the Miami Drum Site found no evidence of a contaminant plume from the site.

During the late 1970's, investigations by the U. S. Geological Survey and Technos, Inc., had determined that, based on the dissolved inorganic content of the groundwater, leachate from the 58th Street Landfill had infiltrated the Biscayne Aquifer beneath and adjacent to the landfill site in the form of a groundwater plume moving in an easterly direction along with the natural downgradient water movement. However, based on extensive priority pollutant data (heavy metals as well as organics) that were non-existent during the earlier USGS and Technos studies, no groundwater contaminant plume was found in the vicinity of the landfill from the 1982-1983 RI.

The results of these investigations indicate that, at this time, there is no concentrated contaminant plume emanating from any of the three sites in the study area. However, widespread, low, dispersed levels of volatile organic chemicals have been found all over the study area; plumes have blended together and have now, with time, become indistinguishable with the general poor groundwater quality in the study area. The main explanation for this is the geohydrologic conditions within the study area: the high transmissivity of the Biscayne Aquifer; the widespread interaction of groundwater with surface-water bodies throughout the study area; and the high, continuous pumping of groundwater at the several municipal well fields. The overall groundwater quality in the study area will be addressed in Phase IV.